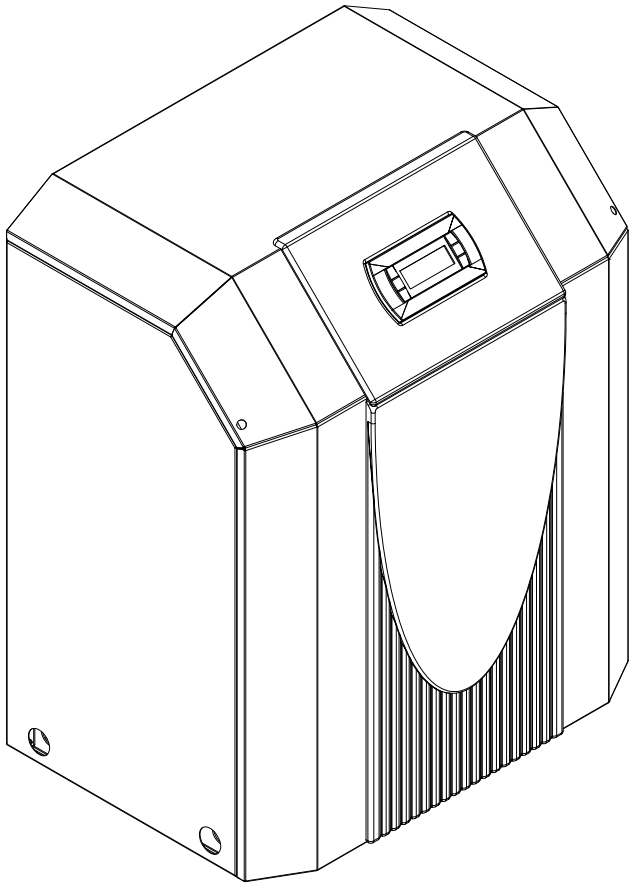
SIH 4ME
SIH 6ME
SIH 9ME
SIH 11ME

Dimplex

Installation and Operating Instructions



Brine-to-Water Heat Pump for Indoor Installation

8/60183/0
ISSUE 2

Table of contents

1 Please Read Immediately 2
1.1 Important Information 2
1.2 Intended Use 2
1.3 Legal Regulations and Directives 2
1.4 Energy-Efficient Use of the Heat Pump 2

2 Purpose of the Heat Pump 3
2.1 Application 3
2.2 Operating Principle 3

3 Basic Device 3

4 Accessories 4
4.1 Brine Circuit Manifold 4
4.2 Remote control 4
4.3 Building management technology 4
4.4 Thermal energy meter WMZ 4

5 Transport 5

6 Set-up 5
6.1 General Information 5
6.2 Acoustic Emissions 5

7 Installation 5
7.1 General Information 5
7.2 Heating System Connection 5
7.3 Heat Source Connection 6
7.4 Temperature sensor 6
7.5 Electrical connection 7

8 Commissioning 8
8.1 General Information 8
8.2 Preparation 8
8.3 Start-up Procedure 8

9 Maintenance and Cleaning 9
9.1 Maintenance 9
9.2 Cleaning the Heating System 9
9.3 Cleaning the Heat Source System 9

10 Faults / Trouble-Shooting 9

11 Decommissioning / Disposal 9

12 Device Information 10

Appendix ..... A-I

1 Please Read Immediately

1.1 Important Information

⚠ ATTENTION!
The heat pump is not secured to the wooden pallet.

⚠ ATTENTION!
The heat pump must not be tilted more than 45° (in any direction).

⚠ ATTENTION!
Do not use the holes in the panel assemblies for lifting the device!

⚠ ATTENTION!
Flush the heating system prior to connecting the heat pump.

⚠ ATTENTION!
The supplied dirt trap must be inserted in the heat source inlet of the heat pump to protect the evaporator against the ingress of impurities.

⚠ ATTENTION!
The brine solution must contain at least a 25 % concentration of a monoethylene glycol or propylene glycol-based antifreeze, which must be mixed before filling.

⚠ ATTENTION!
The heat pump must be started up in accordance with the installation and operating instructions of the heat pump manager.

⚠ ATTENTION!
We recommend the installation of a suitable corrosion protection system to prevent the formation of deposits (e.g. rust) in the condenser of the heat pump.

⚠ ATTENTION!
Any work on the heat pump may only be performed by authorised and qualified after-sales service technicians.

⚠ ATTENTION!
Disconnect all electrical circuits from the power source prior to opening the device.

1.2 Intended Use

This device is only intended for use as specified by the manufacturer. Any other use beyond that intended by the manufacturer is prohibited. This requires the user to abide by the manufacturers product information. Please refrain from tampering with or altering the device.

1.3 Legal Regulations and Directives

This heat pump is designed for use in a domestic environment according to Article 1, Paragraph 2 k) of EC directive 2006/42/EC (machinery directive) and is thus subject to the requirements of EC directive 2006/95/EC (low-voltage directive). It is thus also intended for use by non-professionals for heating shops, offices and other similar working environments, in agricultural establishments and in hotels, guest houses and similar / other residential buildings.

This heat pump conforms to all relevant DIN/VDE regulations and EU directives. Refer to the EC Declaration of Conformity in the appendix for details.

The heat pump must be connected to the power supply in compliance with all relevant VDE, EN and IEC standards. Any further connection requirements stipulated by local utility companies must also be observed.

The heat pump is to be connected to the heat source system and the heating system in accordance with all applicable regulations.

Persons, especially children, who are not capable of operating the device safely due to their physical, sensory or mental abilities or their inexperience or lack of knowledge, must not operate this device without supervision or instruction by the person in charge.

Children must be supervised to ensure that they do not play with the device.

1.4 Energy-Efficient Use of the Heat Pump

By operating this heat pump you are helping to protect our environment. Both the heating system and the heat source must be properly designed and dimensioned to ensure efficient operation. It is particularly important to keep water flow temperatures as low as possible. All connected energy consumers should therefore be suitable for low flow temperatures. Raising the heating water temperature by 1 K corresponds to an increase in energy consumption of approx.
2.5 %. Low-temperature heating systems with flow temperatures between 30 °C and 50 °C are particularly well-suited for energy-efficient operation.

2 Purpose of the Heat Pump

2.1 Application

The brine-to-water heat pump is to be used exclusively for the heating of heating water. It can be used in new or previously existing heating systems. Brine is used as the heat transfer medium in the heat source system. Borehole heat exchangers, ground heat collectors or similar systems can be used as the heat source.

2.2 Operating Principle

The heat generated by the sun, wind and rain is stored in the ground. This heat stored in the ground is collected at a low temperature by the brine circulating in the ground collector, ground coil or similar device. A circulating pump then conveys the “heated” brine to the evaporator of the heat pump. There the heat is given off to the refrigerant in the refrigerating cycle. This cools the brine so that it can once again absorb thermal energy in the brine circuit.

The refrigerant is drawn in by the electrically driven compressor, compressed and “pumped” to a higher temperature level. The electrical power needed to run the compressor is not lost in this process. Most of it is absorbed by the refrigerant.

Subsequently, the refrigerant is passed through the condenser where it transfers its heat energy to the heating water. Depending on the set operating point (thermostat setting), the heating water is thus heated up to a max. of 60 °C.

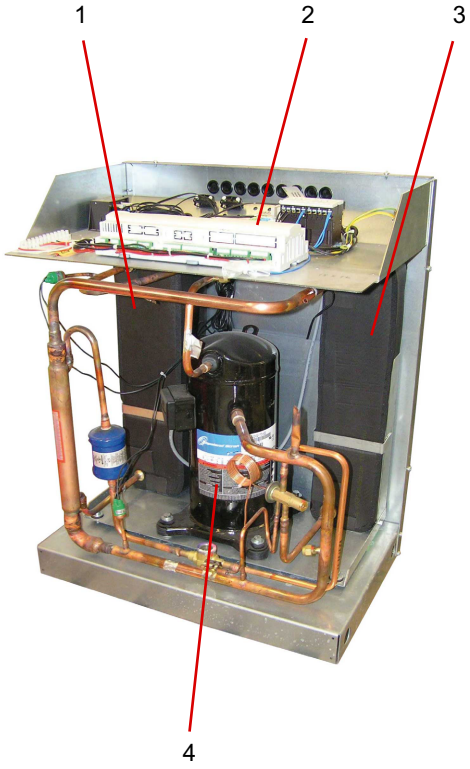
3 Basic Device

The basic device consists of a ready-to-use heat pump for indoor installation, complete with sheet metal casing, control panel and integrated heat pump manager. The refrigerant circuit is hermetically sealed. It contains the Kyoto protocol approved refrigerant R134a with a GWP value of 1300. It is CFC-free, does not deplete ozone and is non-flammable.

All components required for the operation of the heat pump are located on the control panel. An external temperature sensor including fixing accessories and a dirt trap are supplied with the heat pump. The power feed for the load current and the control current must be installed by the customer.

The supply lead of the brine circulating pump (to be provided by the customer) must be connected to the control panel. If required, the supply lead of the brine pump is be equipped with a motor protection device.

The customer must provide both the collector and the brine circuit manifold.

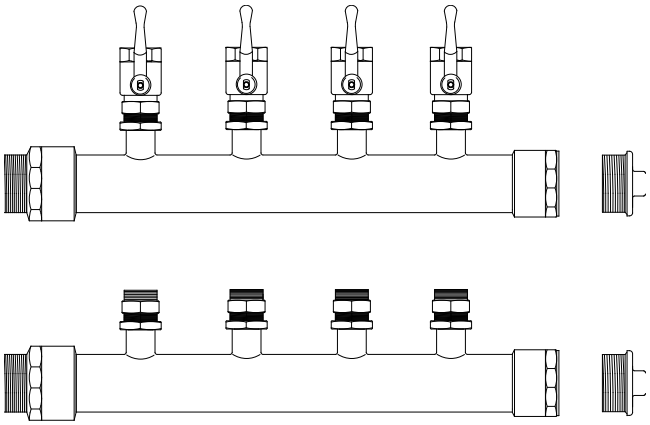


1) Liquifier
2) Control panel
3) Evaporator
4) Compressor

4 Accessories

4.1 Brine Circuit Manifold

The brine circuit manifold merges the individual collector loops of the heat source system into a single main pipe which is connected to the heat pump. Integrated ball valves allow the individual brine circuits to be shut off for de-aeration purposes.



4.2 Remote control

A remote control adds convenience and is available as a special accessory. Operation and menu navigation are identical to those of the heat pump manager. Connection is made using a 6-core telephone cable (special accessory) with modular plugs.

NOTE

In the case of heating controllers with a removable operating element, this can also be used directly as a remote control.

4.3 Building management technology

The heat pump manager can be connected to a building management system network via supplementation of the relevant interface plug-in card. The supplementary installation instructions of the interface card must be consulted regarding the exact connection and parameterisation of the interface.

The following network connections can be made on the heat pump manager:

- Modbus
- EIB, KNX
- Ethernet

4.4 Thermal energy meter WMZ

4.4.1 General description

The thermal energy meter (WMZ 25/32) is used for measuring the quantity of thermal energy supplied. It is available as an accessory. Due to the additional heat exchanger, two thermal energy meters are required for measuring the quantity of thermal energy.

Sensors in the flow and return of the heat exchanger pipes and an electronics module acquire the measured values and transmit a signal to the heat pump manager, which, depending on the current operating mode of the heat pump (heating/DHW/swimming pool), totals the thermal energy in kWh and displays them in the operating data and history menu.

NOTE

The thermal energy meter complies with the quality requirements of the German market incentive programme subsidising efficient heat pumps. The thermal energy meter is not subject to obligatory calibration, and can thus not be used for the heating cost billing procedure!

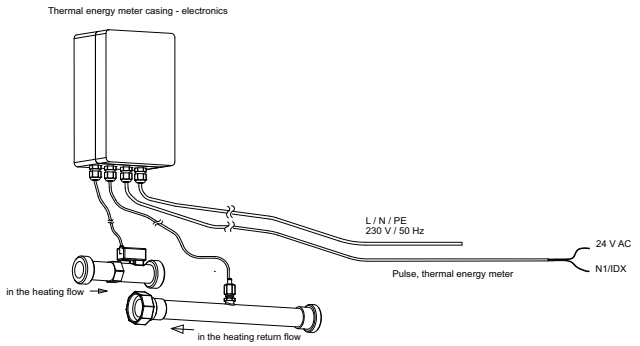
4.4.2 Hydraulic and electrical integration of the thermal energy meter

The thermal energy meter requires two measuring devices for data acquisition.

- A measuring tube for the flow measurement
  This must be installed in the heat pump flow (observe flow direction).
- A temperature sensor (copper pipe with immersion sleeve)
  This must be installed in the heat pump return.

The installation locations for both measuring tubes should be as close to the heat pump as possible in the generator circuit.

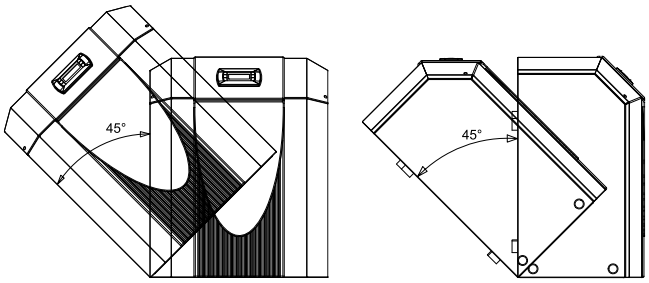
To avoid eddying effects which could lead to incorrect measurements, there should be a gap of 50 cm between the measuring devices and other installed components such as pumps or valves.


Thermal energy meter casing - electronics
L / N / PE
230 V / 50 Hz
24 V AC
N1/IDX
Pulse, thermal energy meter
in the heating flow
in the heating return flow

5 Transport

A lift truck is suited for transporting the unit on a level surface. Carrying straps may be used if the heat pump needs to be transported on an uneven surface or carried up or down stairs. These straps can be passed directly underneath the wooden pallet.

⚠ ATTENTION!
The heat pump is not secured to the wooden pallet.



⚠ ATTENTION!
The heat pump must not be tilted more than 45° (in any direction).

Use the holes provided in the sides of the frame to lift the unit without the pallet. The side panel assemblies must be removed for this purpose. Any commercially available length of pipe can be used as a carrying aid.

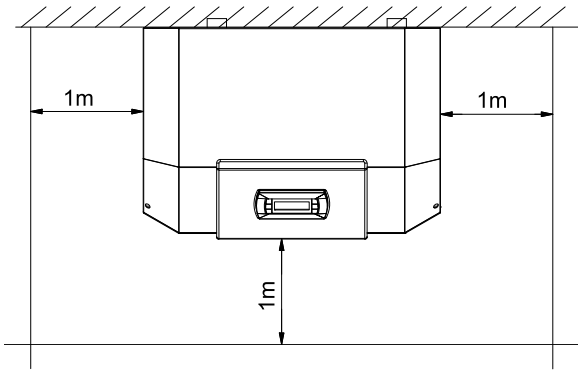
⚠ ATTENTION!
Do not use the holes in the panel assemblies for lifting the device!

6 Set-up

6.1 General Information

The unit may only be installed indoors in rooms with low humidity on a level, smooth and horizontal surface. The entire base of the frame should lie directly on the floor to ensure a good soundproof seal. If this is not the case, additional sound insulation measures may be necessary.

The heat pump must be installed so that maintenance work can be carried out without hindrance. This can be ensured by maintaining a clearance of approx. 1 m in front of and on each side of the heat pump.



Neither frost nor temperatures higher than 35°C must occur in the installation location at any time of the year.

6.2 Acoustic Emissions

The heat pump operates silently due to efficient sound insulation. To prevent noise transmission to the foundation, a suitable, sound dampening rubber mat should be placed underneath the base frame of the heat pump.

To prevent any sound from being transmitted to the heating system, we recommend connecting the heat pump to the heating system by means of hose sections.

7 Installation

7.1 General Information

The following connections need to be established on the heat pump:

- Flow and return flow of the brine system
- Flow and return flow of the heating system
- Temperature sensor
- Power supply

7.2 Heating System Connection

⚠ ATTENTION!
Flush the heating system prior to connecting the heat pump.

Before connecting the heating water system to the heat pump, the heating system must be flushed to remove any impurities, residue from sealants, etc. Any accumulation of deposits in the liquifier could cause the heat pump to completely break down.

Once the heating system has been installed, it must be filled, deaerated and pressure-tested.

Consideration must be given to the following when filling the system:

- Untreated filling water and make-up water must be of drinking water quality (colourless, clear, free from sediments)
- Filling water and make-up water must be pre-filtered (pore size max. 5µm).

Scale formation in hot water heating systems cannot be completely avoided, but in systems with flow temperatures below 60°C the problem can be disregarded.

With medium and high-temperature heat pumps, temperatures above 60°C can be reached.

The following standard values should therefore be adhered to concerning the filling water and make-up water (according to VDI 2035 Sheet 1):

Total heat output in [kW]	Total alkaline earths in mol/m³ and/or mmol/l	Total hardness in dH
up to 200	≤ 2.0	≤ 11.2
200 to 600	≤ 1.5	≤ 8.4
> 600	< 0.02	< 0.11

The sensors which are delivered already connected and loosely placed in the switch box must be mounted and insulated according to the block diagram.

Minimum heating water flow rate

The minimum heating water flow rate through the heat pump must be assured in all operating states of the heating system. This can be accomplished, for example, by installing either a dual differential pressureless manifold or an overflow valve. The procedure for adjusting an overflow valve is described in the Chapter Start-Up.

NOTE

The use of an overflow valve is only recommended for panel heating and a max. heating water flow of 1.3 m³/h. System faults may result if this is not observed.

Antifreeze protection for installation locations prone to frost

The antifreeze function of the heat pump manager is active whenever the heat pump manager and the heat circulating pumps are ready for operation. If the heat pump is taken out of service or in the event of a power failure, the system has to be drained. The heating circuit should be operated with a suitable antifreeze if heat pump systems are implemented in buildings where a power failure can not be detected (holiday home).

7.3 Heat Source Connection

The following procedure must be observed when connecting the heat source:

Connect the brine pipe to the heat pump flow and return. The hydraulic plumbing diagram must be adhered to.

ATTENTION!

The supplied dirt trap must be inserted in the heat source inlet of the heat pump to protect the evaporator against the ingress of impurities.

In addition, a micro bubble air separator must be installed in the heat source system.

The brine liquid must be produced prior to charging the system. The liquid must have an antifreeze concentration of at least 25 % to ensure frost protection down to -14 °C.

Only monoethylene glycol or propylene glycol-based antifreeze may be used.

The heat source system must be de-aerated and checked for leaks.

ATTENTION!

The brine solution must contain at least a 25 % concentration of a monoethylene glycol or propylene glycol-based antifreeze, which must be mixed before filling.

7.4 Temperature sensor

The following temperature sensors are already installed or must be installed additionally:

- External temperature (R1)
- Temperature 1st, 2nd and 3rd heating circuit (R2, R5 and R13)
- Flow temperature (R9)
- Hot water temperature (R3)
- Temperature of renewable heat accumulator (R13)

7.4.1 Sensor characteristic curves

Temperature in °C			-20	-15	-10	-5	0	5	10
Standard NTC-2 in kΩ			14.6	11.4	8.9	7.1	5.6	4.5	3.7
NTC-10 in kΩ			67.7	53.4	42.3	33.9	27.3	22.1	18.0
15	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**
2.9	2.4	2.0	1.7	1.4	1.1	1.0	0.8	0.7	0.6
14.9	12.1	10.0	8.4	7.0	5.9	5.0	4.2	3.6	3.1

The temperature sensors to be connected to the heat pump manager must correspond to the sensor characteristic curve illustrated in Fig.7.1 on pag. 6. The only exception is the external temperature sensor included in the scope of supply of the heat pump (see Fig.7.2 on pag. 6)

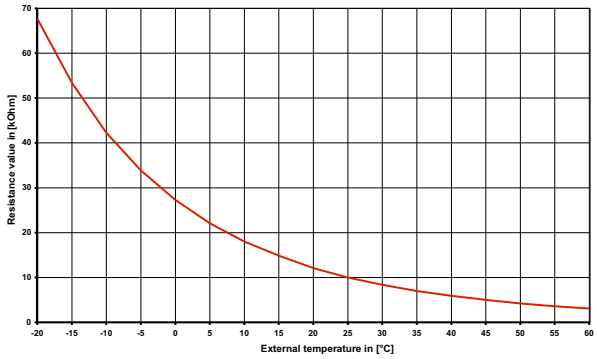


Fig. 7.1:Sensor characteristic curve NTC-10 I

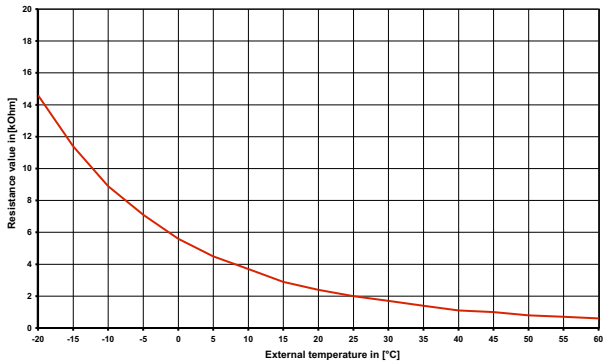


Fig. 7.2:Sensor characteristic curve, standardised NTC-2 according to DIN 44574
External temperature sensor

7.4.2 Mounting the external temperature sensor

The temperature sensor must be mounted in such a way that all weather conditions are taken into consideration and the measured value is not falsified.

- On the external wall of a heated room used as living space, if possible on the north or north-west side of the building
- Do not install in a “sheltered position” (e.g. in a wall niche or under a balcony)
- Not in the vicinity of windows, doors, exhaust air vents, external lighting or heat pumps
- Not to be exposed to direct sunlight at any time of year

Sensor lead: Max. length 40 m; min. core cross-section 0.75 mm²; external diameter of the cable 4-8 mm.

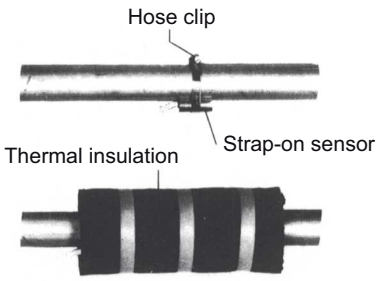
7.4.3 Installing the strap-on sensor

It is only necessary to mount the strap-on sensors if they are included in the scope of supply of the heat pump but have not yet been installed.

The strap-on sensors can be fitted as pipe-mounted sensors or installed in the immersion sleeve of the compact manifold.

Mounting as a pipe-mounted sensor

- Remove paint, rust and scale from heating pipe.
- Coat the cleaned surface with heat transfer compound (apply sparingly).
- Attach the sensor with a hose clip (tighten firmly, as loose sensors can cause malfunctions) and thermally insulate.



7.4.4 Hot water distribution system

The KPV compact manifold and the dual differential pressureless manifold function as an interface between the heat pump, the heating distribution system, the buffer tank and, in some cases, even the hot water cylinder. A compact system is used to simplify the installation process, so that a lot of different components do not have to be installed individually. Further information can be found in the relevant installation instructions.

Compact manifold

The return sensor can remain in the heat pump, or should be installed in the immersion sleeve. The remaining empty space between the sensor and the immersion sleeve must be filled completely with heat transfer compound.

DDV 32 dual differential pressureless manifold

In order for the heating circuit pumps of the generator and consumer circuits to supply the flow to the return sensor, this must be installed in the immersion sleeve of the dual differential pressureless manifold.

7.5 Electrical connection

7.5.1 General

During start-up, observe the respective national safety regulations and the applicable VDE safety regulations, particularly VDE 0100, as well as the technical connection requirements of the utility companies (EVU) and network operators!

To ensure that the frost protection function of the heat pump works properly, the heat pump manager must remain connected to the power supply and the flow must be maintained through the heat pump at all times.

The switching contacts of the output relay are interference-suppressed. Therefore, depending on the internal resistance of the measuring instrument, a voltage can also be measured when the contacts are open. However, this will be much lower than the line voltage.

Extra-low voltage is connected to controller terminals N1-J1 to N1-J11; N1-J24 and terminal strip X2; X3. If, due to a wiring error, the line voltage is mistakenly connected to these terminals, the heat pump manager will be destroyed.

7.5.2 Electrical installation

1) The supply cable for the output section of the heat pump (up to 3-core) are fed from the electricity meter of the heat pump via the utility blocking contactor (if required) into the heat pump (see heat pump operating instructions for supply voltage).
   Connection of the mains cable to the control panel of the heat pump via terminal X6: L/N//PE.
   An all-pole disconnecting device with a contact gap of at least 3 mm (e.g. utility blocking contactor or power contactor) and an all-pole circuit breaker with common tripping for all external conductors must be installed in the power supply for the heat pump (tripping current and characteristic in compliance with the device information).
2) The three-core supply cable for the heat pump manager (heating controller N1) is fed into the heat pump . Connection of the control line to the control panel of the heat pump via terminal X1: L/N/PE.
   The (L/N/PE~230 V, 50 Hz) supply cable for the heat pump manager must have a constant voltage. For this reason, it should be tapped upstream from the utility blocking contactor or be connected to the household current, as important protection functions could otherwise be lost during a utility block.
3) The utility blocking contactor(K22) with main contacts and an auxiliary contact should be dimensioned according to the heat pump output and must be supplied by the customer.
   The NO contact of the utility blocking contactor is looped from terminal strip G/24 V AC to connector terminal J5/ID3.
   CAUTION! Extra-low voltage!
4) The contactor (K20) for the immersion heater (E10) of mono energy systems (HG2) should be dimensioned according to the radiator output and must be supplied by the customer. It is controlled (230 V AC) by the heat pump manager via terminals N and N1-J13/NO4.
5) The contactor (K21) for the flange heater (E9) in the hot water cylinder should be dimensioned according to the radiator output and must be supplied by the customer. It is controlled (230 V AC) by the heat pump manager via terminals N and N1-J16/NO 10.

6) The contactors mentioned above in points 3, 4 and 5 are installed in the electrical distribution system. The mains cables for the heating elements should be dimensioned and protected according to DIN VDE 0100.
7) All cables must be installed as permanent wiring.
8) The heat circulating pump (M13) is connected to terminals N and **N1-J13/NO 5**.
9) The DHW loading pump (M18) is connected to terminals N and **N1-J13/NO 6**.
10) The brine or well pump is connected to terminals N and **N1-J13/NO 3**.
11) The return sensor (R2) is integrated into heat pumps for indoor installation.
The heat pump manager is connected via the following terminals: GND and **N1-J2/B2**.
12) The external sensor (R1) is connected to terminals GND and **N1-J2/B1**.
13) The hot water sensor (R3) is installed in the hot water cylinder and is connected to terminals GND and **N1-J2/B3**.

8 Commissioning

8.1 General Information

To ensure that start-up is performed correctly, it should only be carried out by an after-sales service technician authorised by the manufacturer. This may be a condition for extending the guarantee (see Warranty).

8.2 Preparation

The following items need to be checked prior to start-up:

- The heat pump must be fully connected, as described in Chapter 7.
- The heat source system and the heating circuit must have been filled and checked.
- The dirt trap must be inserted in the brine inlet of the heat pump.
- All valves that could impair proper flow in the brine and heating circuits must be open.
- The heat pump manager must be adapted to the heating system in accordance with the controller's operating instructions.

8.3 Start-up Procedure

The heat pump is started up via the heat pump manager.

⚠ ATTENTION!

The heat pump must be started up in accordance with the installation and operating instructions of the heat pump manager.

If an overflow valve is fitted to assure the minimum heating water flow rate, the valve must be set in accordance with the requirements of the respective heating system. Incorrect adjustment can lead to faulty operation and increased energy consumption. We recommend carrying out the following procedure to correctly adjust the overflow valve:

Close all of the heating circuits that may also be closed during operation (depending on the type of heat pump usage) so that the most unfavourable operating state - with respect to the water flow rate - is achieved. This normally means the heating circuits of the rooms on the south and west sides of the building. At least one heating circuit must remain open (e.g. bathroom).

The overflow valve should be opened far enough to produce the maximum temperature spread between the heating flow and return flow listed in the table below for the current heat source temperature. The temperature spread should be measured as close as possible to the heat pump. The heating element of mono energy systems should be disconnected during start-up.

Heat source temperature		Max. temperature spread between heating flow and return flow
From	To	
-5° C	0° C	10 K
1° C	5° C	11 K
6° C	9° C	12 K
10° C	14° C	13 K
15° C	20° C	14 K
21° C	25° C	15 K

9 Maintenance and Cleaning

9.1 Maintenance

To prevent faults due to sediment in the heat exchangers, care must be taken to ensure that no impurities can enter either the heat source system or the heating system. In the event that operating malfunctions due to contamination occur nevertheless, the system should be cleaned as described below.

9.2 Cleaning the Heating System

The ingress of oxygen into the heating water circuit may result in the formation of oxidation products (rust), particularly if steel components are used. This oxygen enters the heating system via the valves, the circulating pumps and/or plastic pipes. It is therefore essential - in particular with respect to the piping of underfloor heating systems - that only diffusion-proof materials are used.

⚠ ATTENTION!

We recommend the installation of a suitable corrosion protection system to prevent the formation of deposits (e.g. rust) in the condenser of the heat pump.

Residue from lubricants and sealants may also contaminate the heating water.

In the case of severe contamination leading to a reduction in the performance of the liquifier in the heat pump, the system must be cleaned by a heating technician.

According to today's state of knowledge, we recommend using a 5 % phosphoric acid solution for cleaning purposes. However, if cleaning needs to be performed more frequently, a 5 % formic acid solution should be used.

In either case, the cleaning fluid should be at room temperature. We recommend flushing the heat exchanger in the direction opposite to the normal flow direction.

To prevent acidic cleaning agents from entering the heating system circuit, we recommend connecting the flushing device directly to the flow and return flow of the liquifier. It is important that the system be thoroughly flushed using appropriate neutralising agents to prevent any damage from being caused by cleaning agent residue remaining in the system.

Acids must be used with great care and all relevant regulations of the employers' liability insurance associations must be adhered to.

If in doubt, contact the manufacturer of the chemicals!

9.3 Cleaning the Heat Source System

⚠ ATTENTION!

The supplied dirt trap must be inserted in the heat source inlet of the heat pump to protect the evaporator against the ingress of impurities.

The filter sieve of the dirt trap should be cleaned one day after-start-up. Further checks must be set according to the level of dirt.If no more signs of contamination are evident, the filter can be removed to reduce pressure drops.

10 Faults / Trouble-Shooting

This heat pump is a quality product and is designed for trouble-free operation. In the event that a fault should occur, it will be indicated on the heat pump manager display. Simply consult the Faults and Trouble-Shooting page in the operating instructions of the heat pump manager.

If you cannot correct the fault yourself, please contact your after-sales service technician.

⚠ ATTENTION!

Any work on the heat pump may only be performed by authorised and qualified after-sales service technicians.

⚠ ATTENTION!

Disconnect all electrical circuits from the power source prior to opening the device.

11 Decommissioning / Disposal

Before removing the heat pump, disconnect it from the power source and close all valves. Observe all environmentally-relevant requirements regarding the recovery, recycling and disposal of materials and components in accordance with all applicable standards. Particular attention should be paid to the proper disposal of refrigerants and refrigeration oils.

12 Device Information

				SIH 4ME	SIH 6ME	SIH 9ME	SIH 11ME
1	**Type and order code**						
2	**Design**						
2.1	**Degree of protection according to EN 60 529**			IP 20	IP 20	IP 20	IP 20
2.2	**Installation Location**			Indoors	Indoors	Indoors	Indoors
3	**Performance data**						
3.1	**Operating temperature limits:**						
	Heating water flow[1]		**°C**	70±2	70±2	70±2	70±2
	Brine (heat source)		**°C**	-5 to +25	-5 to +25	-5 to +25	-5 to +25
	Antifreeze			Mono-ethylene glycol	Mono-ethylene glycol	Mono-ethylene glycol	Mono-ethylene glycol
	Minimum brine concentration (-13 °C freezing temperature)			25%	25%	25%	25%
3.2	**Temperature spread of heating water (flow/return flow) at B0 / W35**		**K**	5.0	5.0	5.0	5.0
3.3	**Heat output / COP**	**at B0 / W45** [2]	**kW / ---**	4.1 / 3.0	5.8 / 3.4	8.6 / 3.4	10.0 / 3.5
		at B0 / W35 [2]	**kW / ---**	4.3 / 3.8	6.0 / 4.1	8.9 / 4.0	10.7 / 4.5
3.4	**Sound power level to EN 12102**		**dB(A)**	55	56	56	57
3.5	**Heating water flow with an internal pressure differential of**		**m³/h / Pa**	0.75 / 1000	1.0 / 4100	1.55 / 6400	1.9 / 7000
3.6	**Brine throughput with an internal pressure differential (heat source) of**		**m³/h / Pa**	1.00 /7000	1.30 /8900	2.0 / 7500	2.45 / 8000
3.7	**Refrigerant; total filling weight**		**type / kg**	R134a / 1.5	R134a / 1.8	R134a / 2.2	R134a / 2.4
3.8	**Lubricant; total filling weight**		**type / litres**	Polyolester (POE) / 1.0	Polyolester (POE) / 1.1	Polyolester (POE) / 1.95	Polyolester (POE) / 1.90
4	**Dimensions, connections and weight**						
4.1	**Device dimensions without connections** [3]		**H x W x L mm**	805 × 650 × 462	805 × 650 × 462	805 × 650 × 462	805 × 650 × 462
4.2	**Device connections to heating system**		**Inch**	G 1¼" a	G 1¼" a	G 1¼" a	G 1¼" a
4.3	**Device connections to heat source**		**Inch**	G 1¼" a	G 1¼" a	G 1¼" a	G 1¼" a
4.4	**Weight of the transportable unit(s) incl. packing**		**kg**	118	118	130	133
5	**Electrical Connection**						
5.1	**Nominal voltage; fuse protection**		**V / A**	230 / 16	230 / 20	230 / 25	230 / 32
5.2	**Nominal power consumption** [2]	**B0 W35**	**kW**	1.15	1.47	2.22	2.36
5.3	**Starting current with soft starter**		**A**	26	38	43	45
5.4	**Nominal current B0 W35 / cos φ**		**A / ---**	6.2 / 0.8	9.3 / 0.8	11.2 / 0.8	12.4 / 0.8
6	**Complies with the European safety regulations**			[4]	[4]	[4]	[4]
7	**Additional model features**						
7.1	**Water in device protected against freezing** [5]			Yes	Yes	Yes	Yes
7.2	**Performance levels**			1	1	1	1
7.3	**Controller internal/external**			Internal	Internal	Internal	Internal
7.4	**Max. operating overpressure (heat source/heat sink) bar**			3,0	3,0	3,0	3,0

1. For brine temperatures between -5 °C and 0 °C, flow temperature increasing from 65 °C to 70 °C
2. This data indicates the size and capacity of the system. For an analysis of the economic and energy efficiency of the system, both the bivalence point and the regulation should also be taken into consideration. The specified values, e.g. B10 / W55, have the following meaning: Heat source temperature 10 °C and heating water flow temperature 55 °C.
3. Note that additional space is required for pipe connections, operation and maintenance.
4. See CE declaration of conformity
5. The heat circulating pump and the heat pump manager must always be ready for operation.

Appendix

1 Dimension Drawings ..... A-II

1.1 Dimension Drawing ..... A-II

2 Diagrams ..... A-III

2.1 Characteristic Curves SIH 4ME ..... A-III

2.2 Characteristic Curves SIH 6ME ..... A-IV

2.3 Characteristic Curves SIH 9ME ..... A-V

2.4 Characteristic Curves SIH 11ME ..... A-VI

3 Circuit Diagrams ..... A-VII

3.1 Control ..... A-VII

3.2 Load ..... A-VIII

3.3 Terminal Connection Plan ..... A-IX

3.4 Legend ..... A-X

4 Hydraulic Plumbing Diagram ..... A-XI

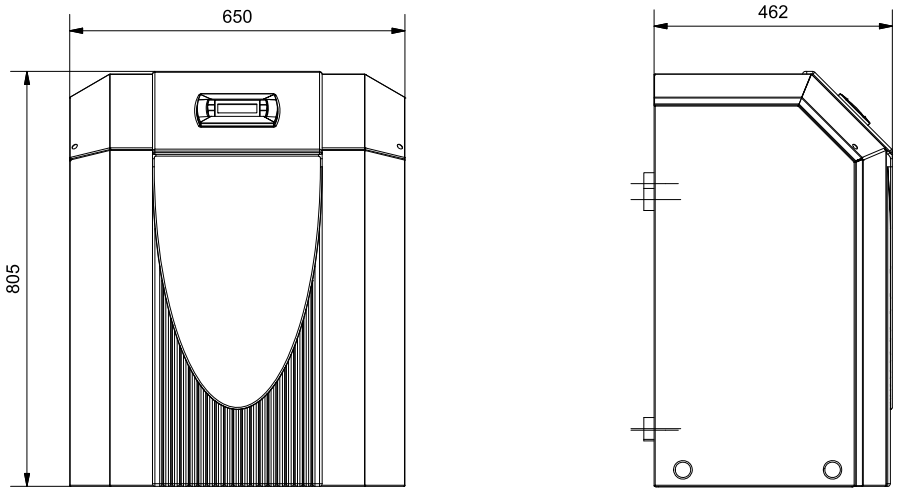
4.1 Monovalent heat pump system with three heating circuits and domestic hot water preparation ..... A-XI

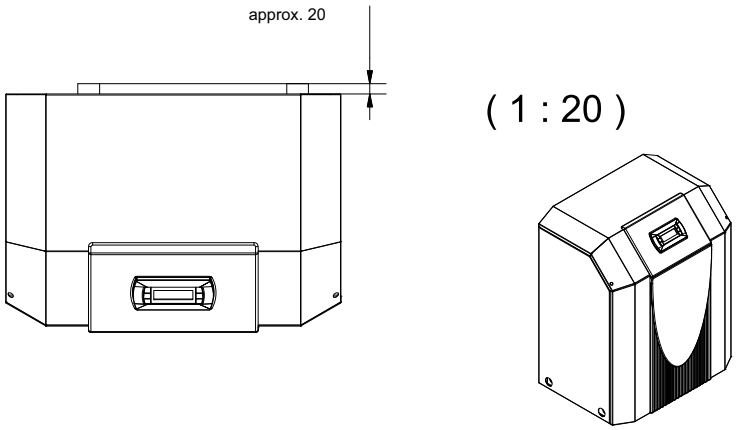
4.2 Legend ..... A-XII

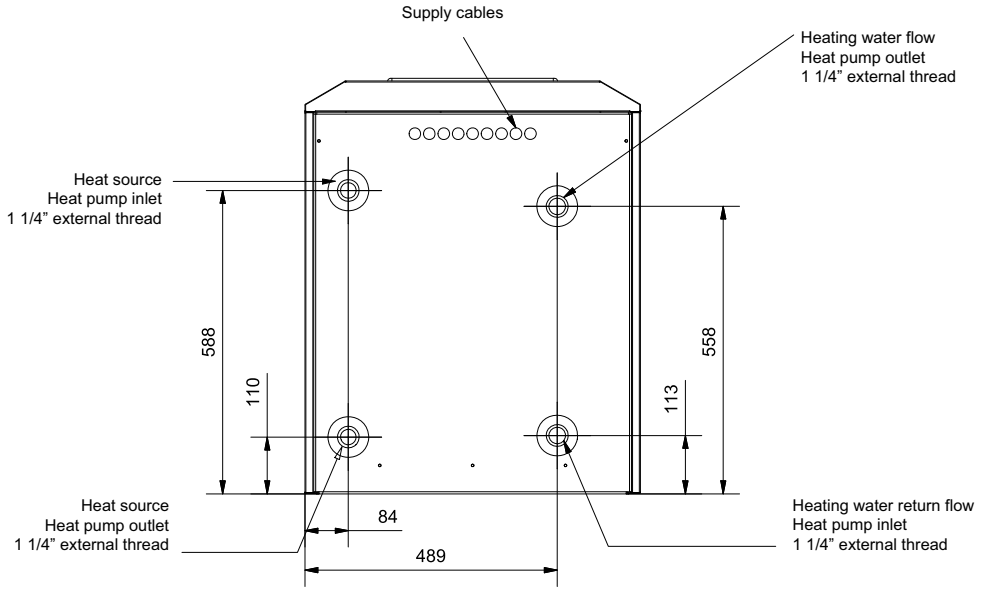
5 Declaration of Conformity ..... A-XIII

1 Dimension Drawings

1.1 Dimension Drawing

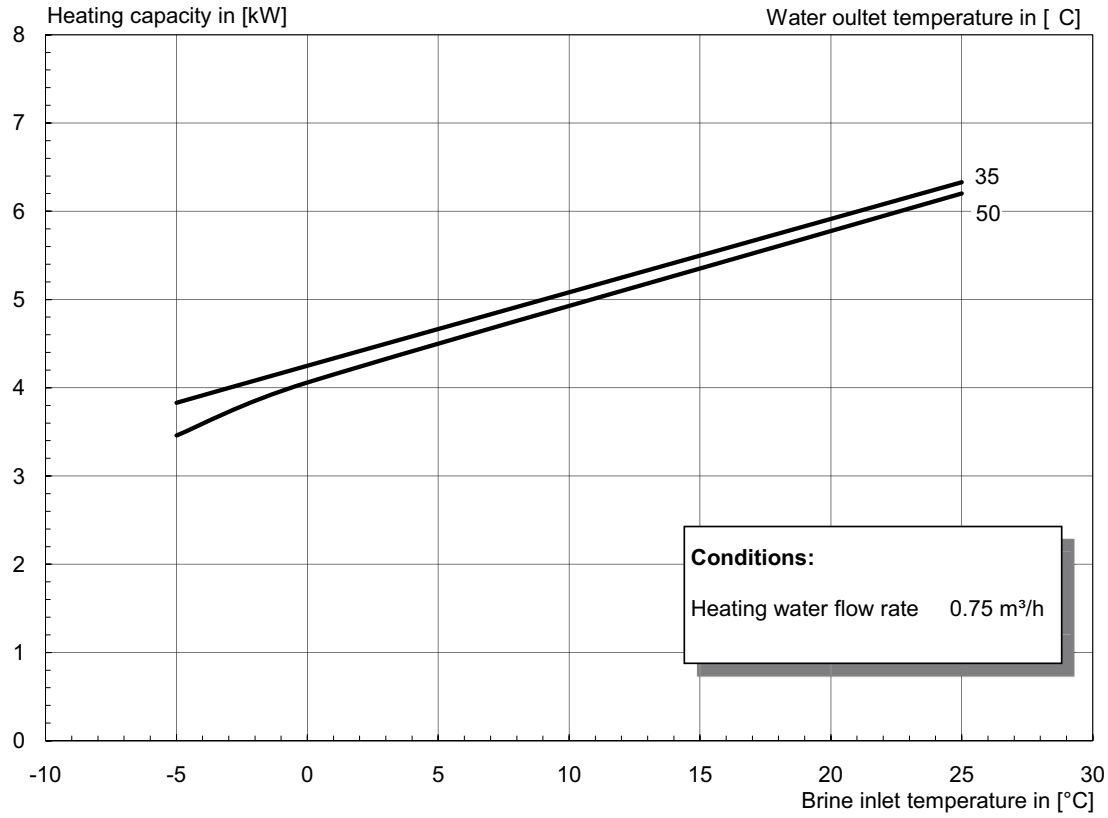


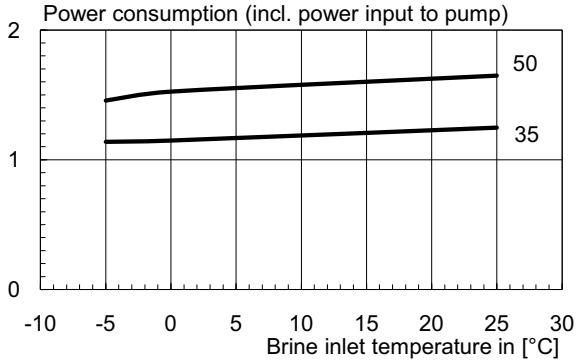


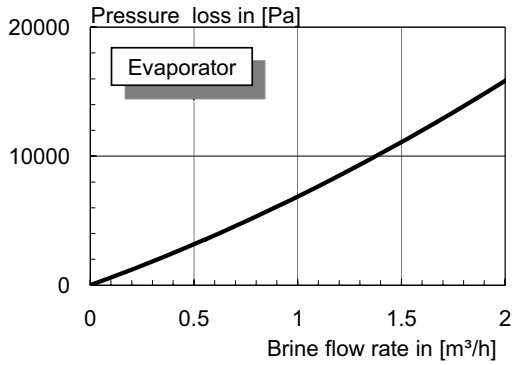


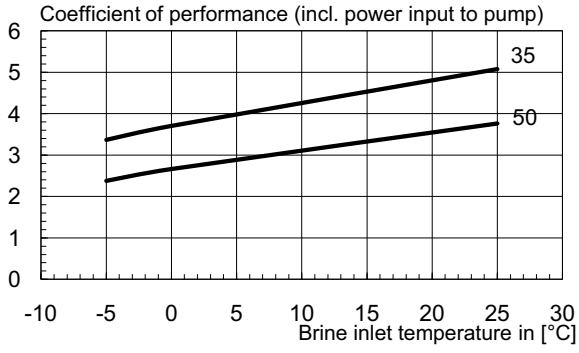
2 Diagrams

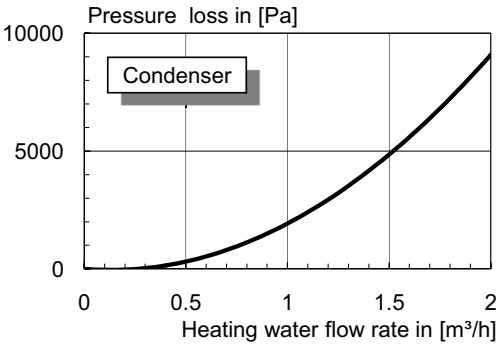
2.1 Characteristic Curves SIH 4ME



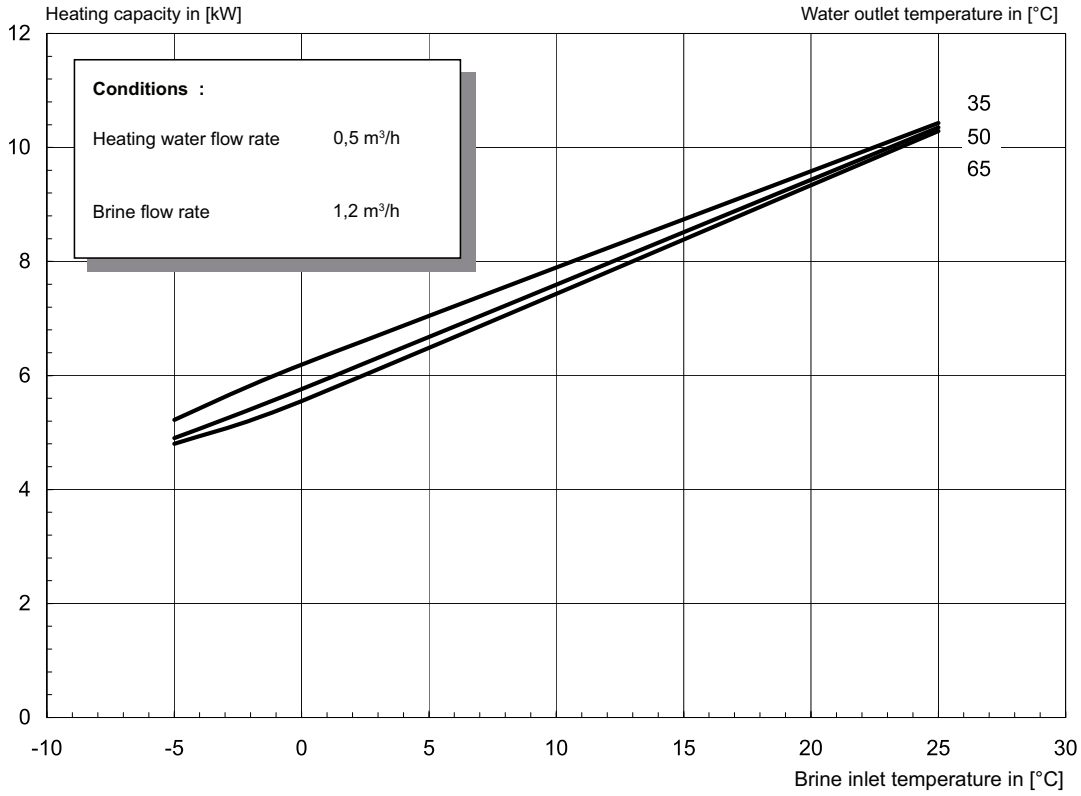


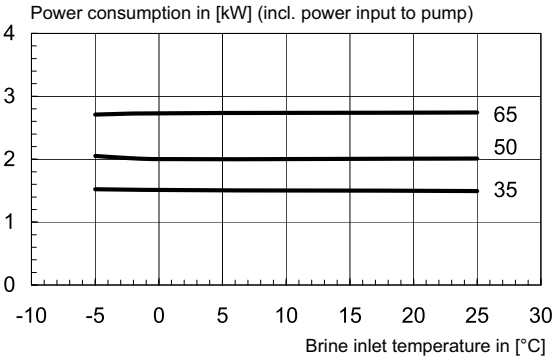


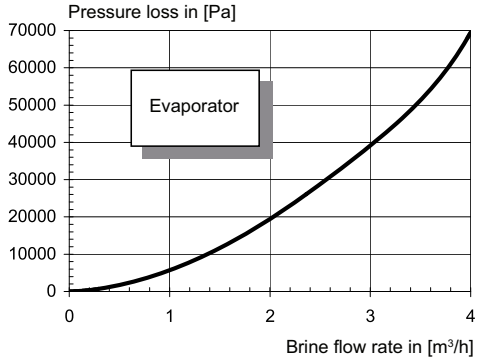


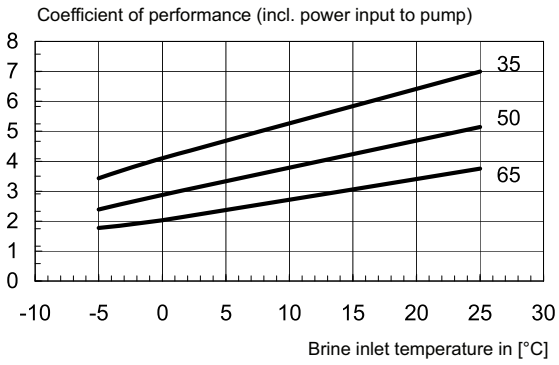


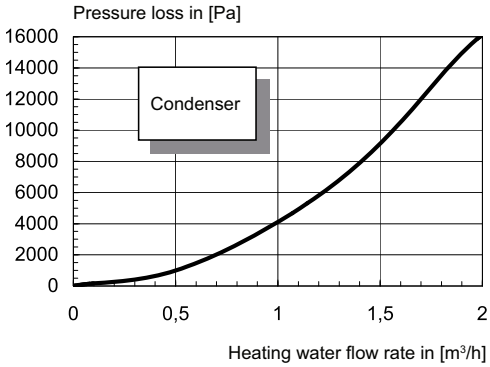
2.2 Characteristic Curves SIH 6ME



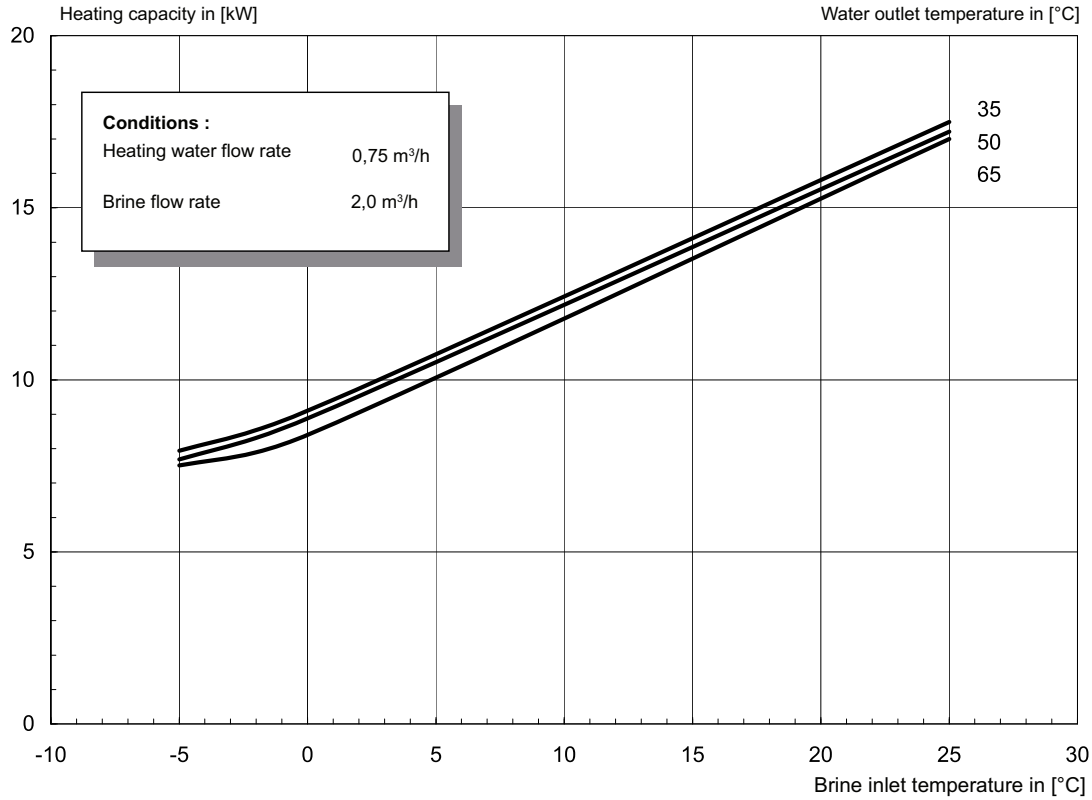


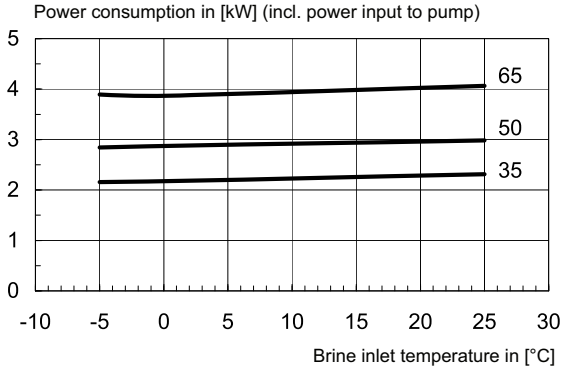


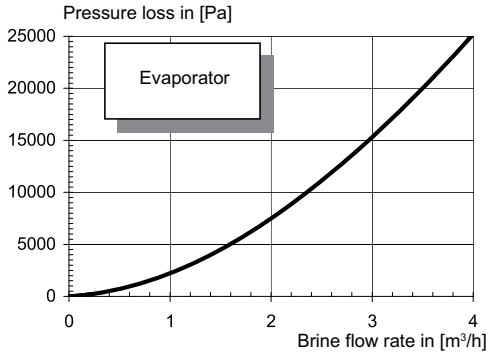


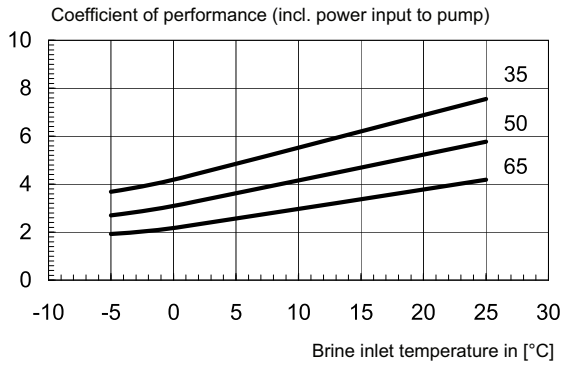


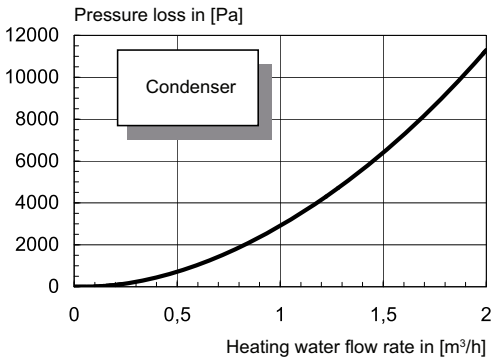
2.3 Characteristic Curves SIH 9ME



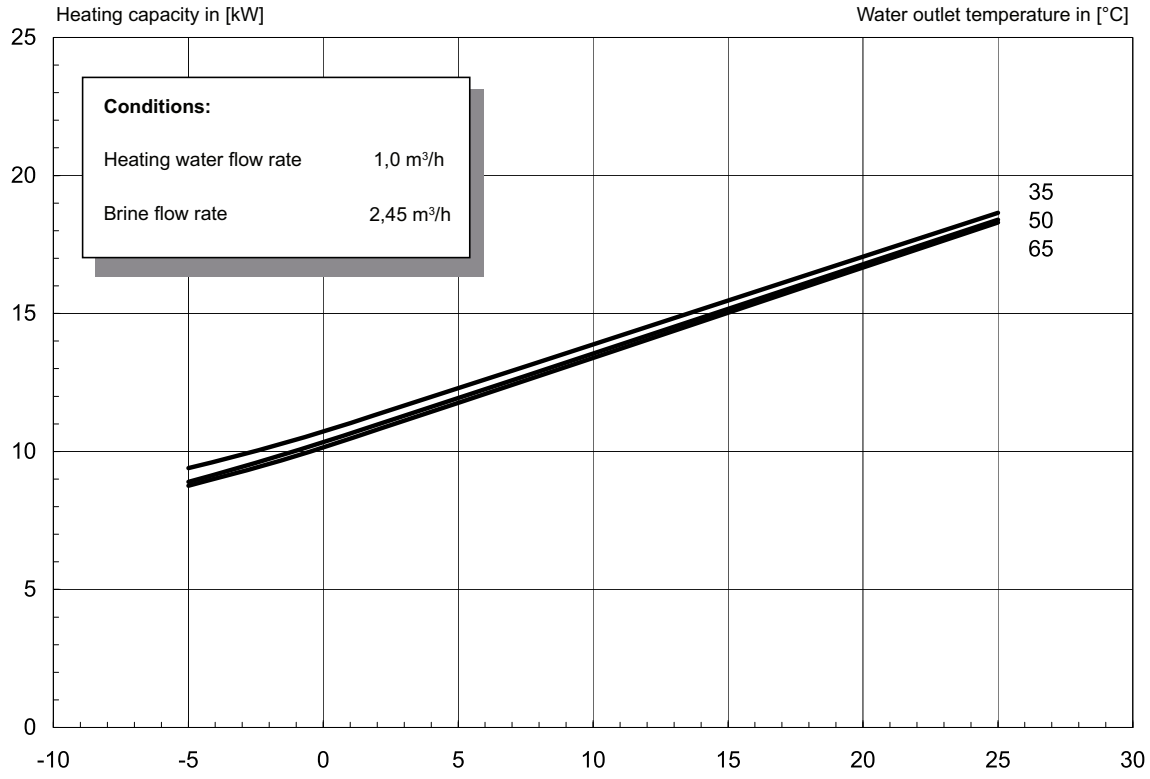




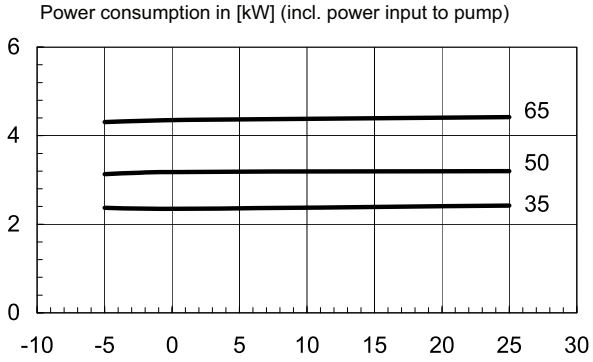


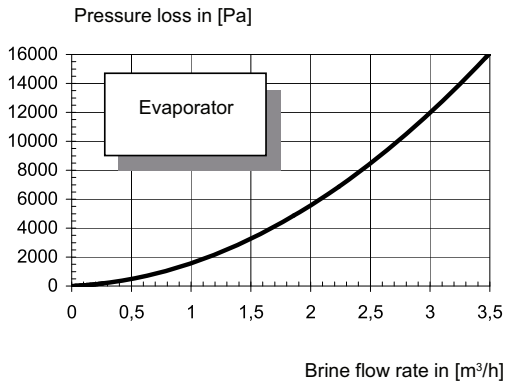


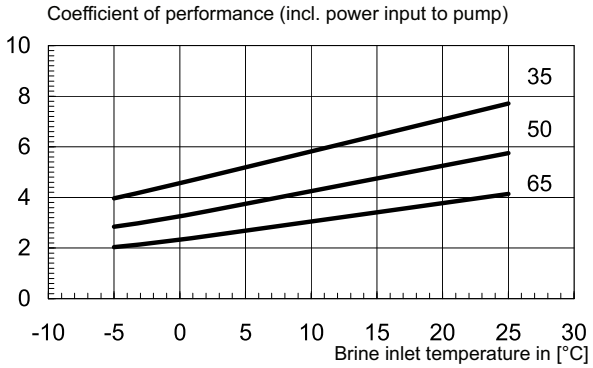
2.4 Characteristic Curves SIH 11ME

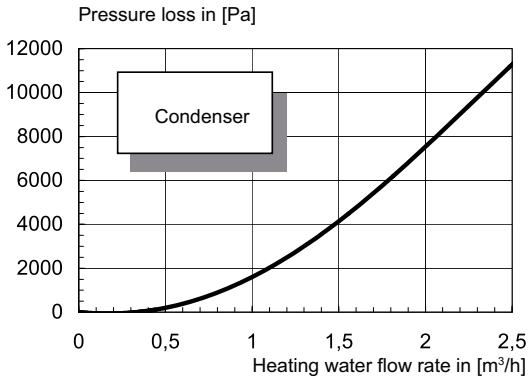


Brine inlet temperature in [°C]



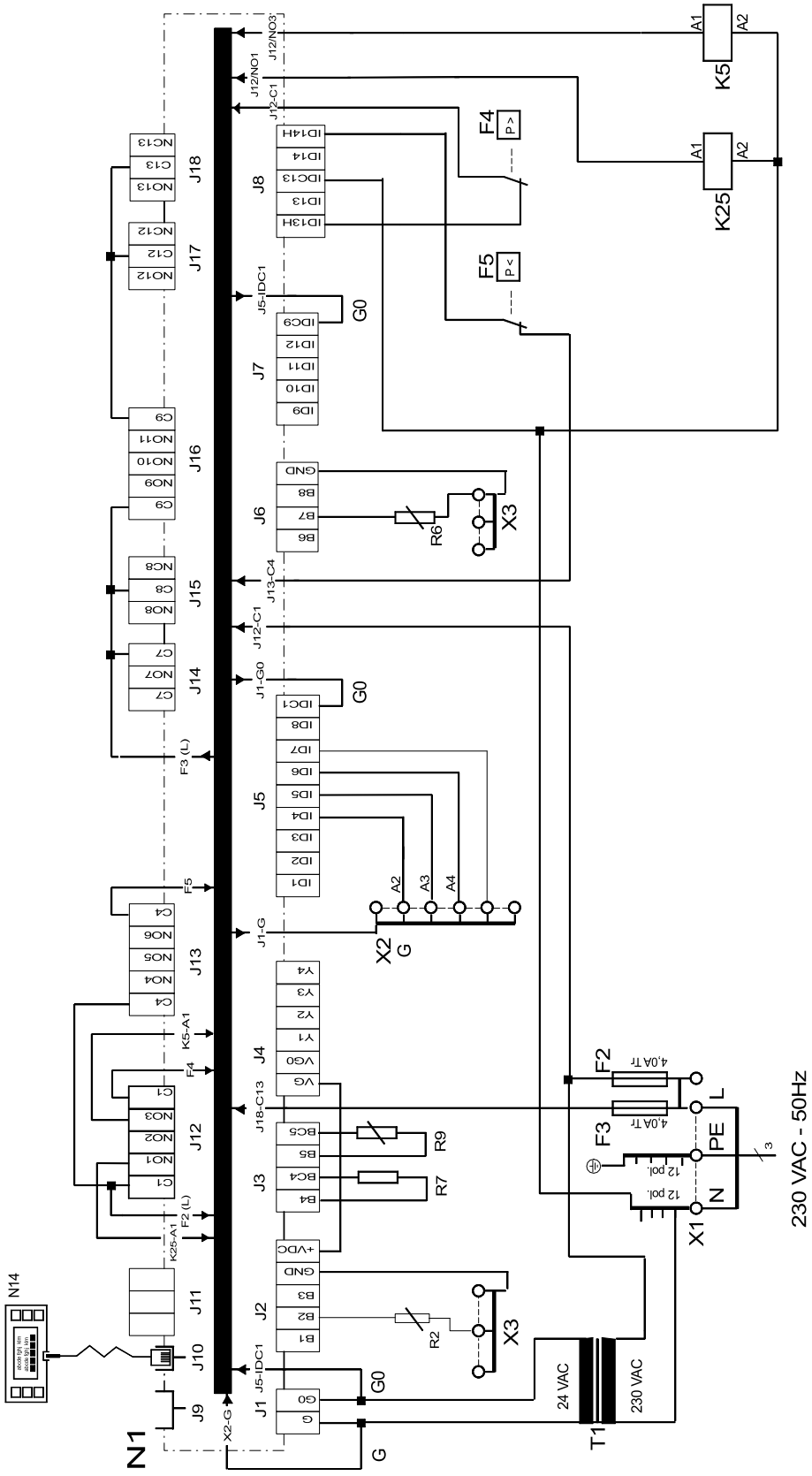




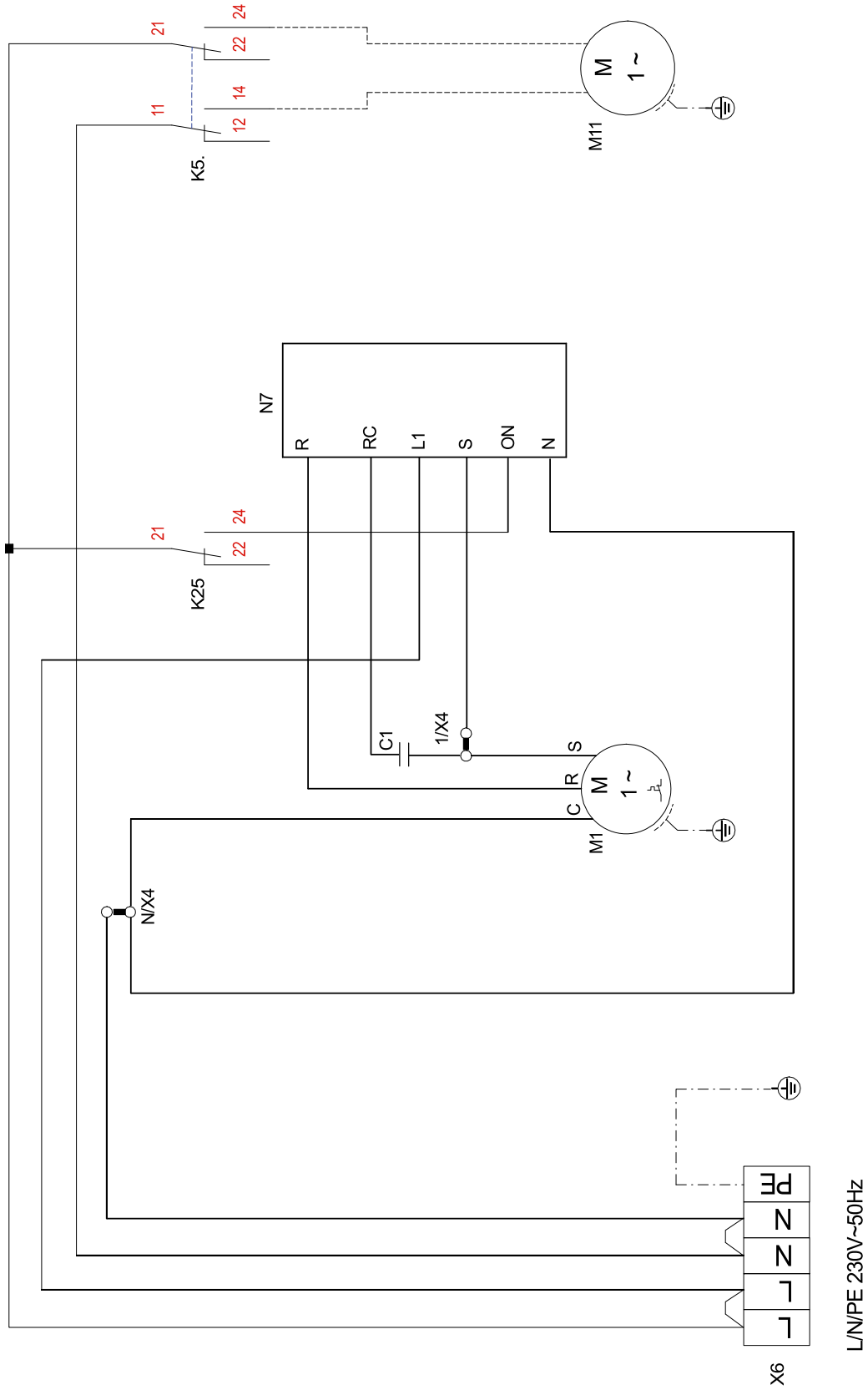


3 Circuit Diagrams

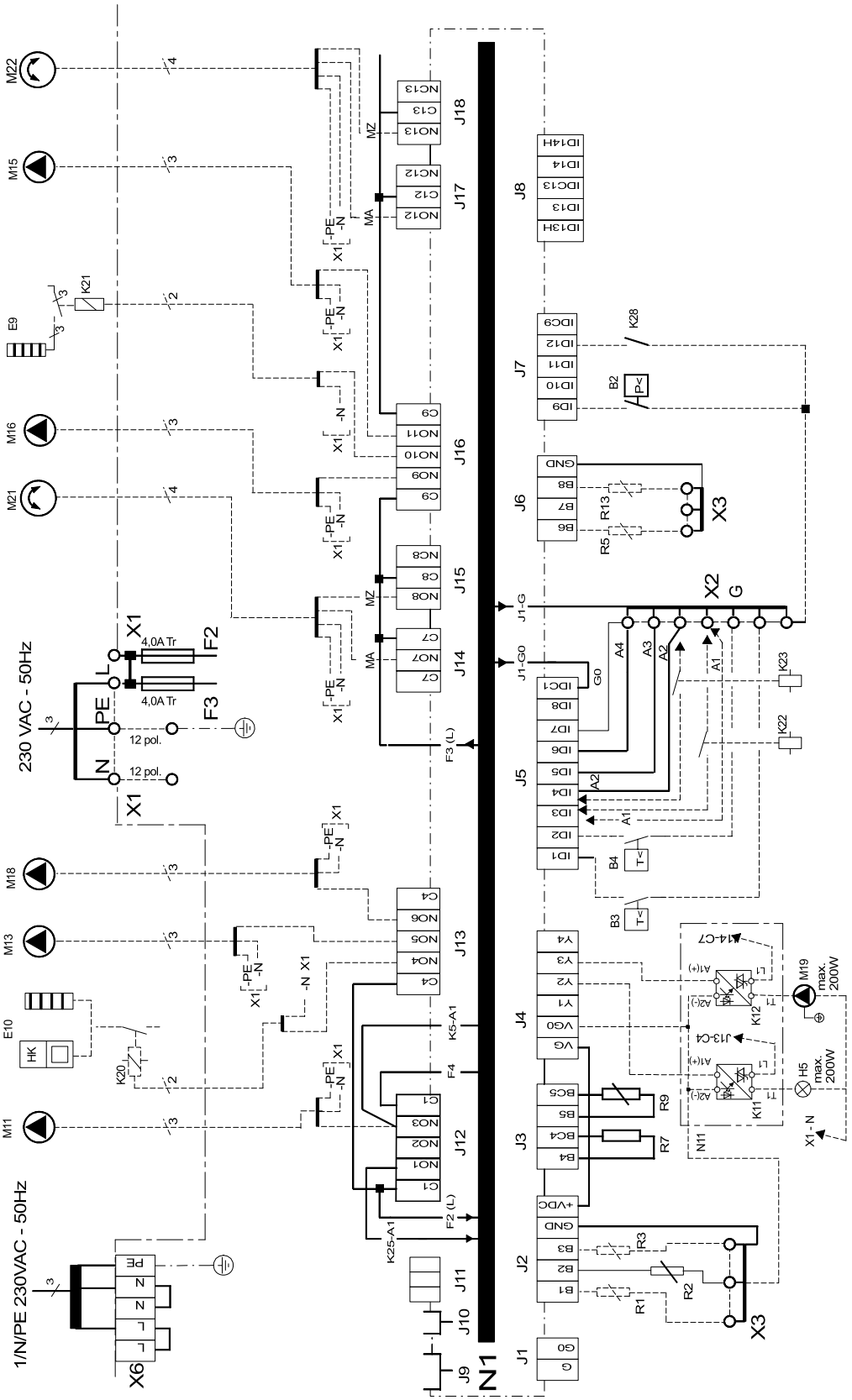
3.1 Control



3.2 Load


21
24
22
14
11
12
K5.
M
1 ~
M11
N7
R
RC
L1
S
ON
N
K25
C1
1/X4
S
R
C
M1
N/X4
PE
N
N
L
L
X6
L/N/PE 230V~50Hz

3.3 Terminal Connection Plan



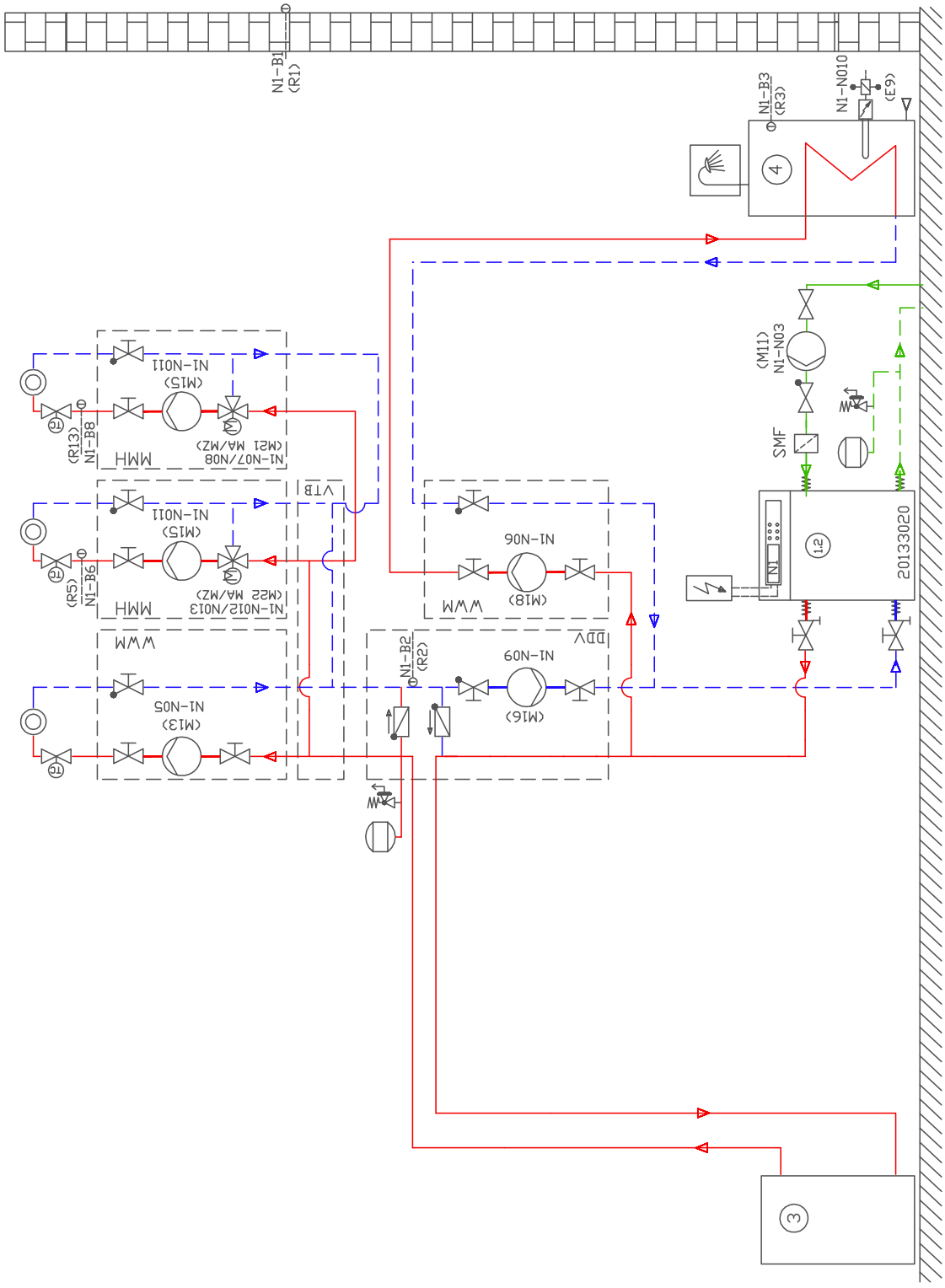
3.4 Legend

A1	Wire jumper, must be inserted if no blocking contactor is fitted
A2	Wire jumper, must be removed if the 2nd disable contactor is used
A3	Wire jumper, must be removed if a motor protection contact is used for the primary pump
A4	Wire jumper, must be removed when a motor protection contact is used for the compressor Open wire jumpers or contacts mean: block or fault
B2*	Low-pressure brine controller
B3*	Hot water thermostat
B4*	Swimming pool water thermostat
C1	Running capacitor, compressor
E10*	2nd heat generator (function selectable via controller)
F2	Load fuse for N1 relay outputs at J12 and J13 4.0 slow-acting
F3	Load fuse for N1 relay outputs at J15 to J18 4.0 slow-acting
F4	High-pressure switch
F5	Low-pressure switch
J1...J18	Terminal connector at N1
K5	Contactor for primary pump (PUP)
K11*	Electron. remote fault indicator relay
K12*	Electron. relay for swimming pool water circulating pump
K20*	Contactor for 2nd heat generator (boiler or electric heating element)
K21*	Contactor, electric immersion heater, hot water
K22*	Utility blocking contactor
K23*	SPR auxiliary relay
K25	Starting relay for N7
K28*	External switching to "cooling" operation
M1	Compressor
M11*	Primary pump
M13*	Heat circulating pump
M15*	Heat circulating pump for heating circuit 2
M16*	Auxiliary circulating pump
M18*	Hot water loading pump
M19*	Swimming pool circulating pump
M21*	Mixer, principal circuit
M22*	Mixer for heating circuit 2
N1	heat pump manager
N7	Soft start control
N11*	Relay module
N14	Operating element
R1*	External sensor
R2	Return flow sensor
R3*	Hot water sensor (as an alternative to the hot water thermostat)
R5*	Sensor for heating circuit 2
R6	Flow temperature limit sensor
R7	Coding resistor 40.2 kOhm
R9	Flow sensor
R13*	Heating circuit 3 / renewable sensor
T1	Safety isolating transformer 230/24 V AC-28 VA
X1	Terminal strip mains control L/N/PE-230V AC-50 Hz/fuses/N and PE terminal blocks
X2	
X3	Terminal strip for GND terminal block for sensors
X4	Terminal strip Compressor
X6	Terminal strip for power supply L/N/PE-230V AC-50 Hz

	Abbreviations:
EVS	Utility disable contactor
SPR	Supplementary disable contactor
MA	Mixer OPEN
MZ	Mixer CLOSED
*	Components to be supplied from external sources
- - - - -	To be connected by the customer as required
———	Wired ready for use

4 Hydraulic Plumbing Diagram

4.1 Monovalent heat pump system with three heating circuits and domestic hot water preparation



4.2 Legend

	Check valve
	Shutoff valve
	Dirt trap
	Three-way mixer
	Circulating pump
	Expansion vessel
	Room temperature-controlled valve
	Shutoff valve with check valve
	Shutoff valve with drainage
	Safety valve combination
	Heat consumer
	Temperature sensor
	Flexible connection hose
	Check valve

1.2	Brine-to-water heat pump
3	Buffer tank connected in series
4	Hot water cylinder

E9	Flange heater, hot water
M11	Primary circulating pump
M13	Heat circulating pump
M15	Heat circulating pump for heating circuit 2
M16	Auxiliary circulation pump
M18	Hot water loading pump
M21	Mixer for main circuit or heating circuit 3
M22	Mixer for heating circuit 2
N1	Heat pump manager
R1	External wall sensor
R2	Return flow sensor
R3	Hot water sensor
R5	Temperature sensor for heating circuit 2
R13	Sensor for heating circuit 3 / renewable sensor

5 Declaration of Conformity

CE EC Declaration of Conformity

GDC Group Limited,
Millbrook House, Grange Drive,
Hedge End, Southampton,
Hants, SO302DF,
United Kingdom

Manufacturer: Glen Electric Ltd.
Greenbank Industrial Est..
Rampart Road, Newry,
Co. Down

Hereby certified that the following device(s) complies/comply with the applicable EU directives. This certification loses its validity if the device(s) is/are modified.

Description: Heat Pump **Type:** Ground – to – Water **Model**: SIH4ME
Model: SIH6ME
Model: SIH9ME
Model: SIH11ME

EC Directives:

Low voltage directive 2006/95/EC
EMC directive 2004/108/EC
Pressure equipment directive 97/23/EC

Applied Standards:

EN 60335-1:2002+A11+A1+A12+corr.+A2:2006; EN60335-1/A13:2008; EN60335-2-40:2003+A11+A12+A1+corr.+A2:2009
EN55014-1:2006; EN55014-2:1997+A1:2001
EN61000-3-2:2006; EN61000-3-3:1995+A1:2001+A2:2005
EN378-1:2008; EN378-2:2008+A1:2009; EN378-3:2008; EN378-4:2008
EN 14511-1:2007; EN14511-2:2007; EN14511-3:2007+EN14511-3:2007/AC:2008; EN14511-4:2007

Conformity assessment procedure according to pressure equipment directive:
Module A

CE mark added:
2011

EC declaration of conformity issued on:
15th July 2011

Issue: 1